

# Fruit and oats raise risk of type 1 diabetes but berries provide protection, research suggests

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New research being presented at the annual meeting of the [European Association for the Study of Diabetes \(EASD\) in Madrid, Spain](#) (9-13

September), shows that eating fruit, oats and rye in childhood is associated with a higher risk of developing type 1 diabetes (T1D). Eating berries, however, is linked to lower odds of developing the condition.

T1D is an autoimmune condition in which the [immune system attacks](#) and destroys the insulin-producing islet cells in the pancreas. This prevents the body from producing enough of the hormone insulin to properly regulate blood sugar levels.

What triggers the immune system's attack is unknown but is thought to involve a combination of a genetic predisposition and an environmental trigger such as a virus or foodstuff.

T1D, the most common form of diabetes in children, is increasing worldwide. The number of cases worldwide is projected to double in just 20 years, from 8.4 million in 2021 to 17.4 million by 2040. Finland has the highest incidence of T1D globally, with 52.2 cases per 100,000 children under the age of 15—more than five times higher than in the 1950s.

"Type 1 diabetes is a serious condition that requires lifelong treatment and so places a considerable burden on the patient and their family," says Professor Suvi Virtanen, of the Finnish Institute for Health and Welfare, Helsinki, Finland, who led the research.

"It can lead to complications including eye, heart, nerve and kidney problems and shorten [life expectancy](#) and has substantial health care costs (around 1 million euros per patient in Finland). The rapid increase in type 1 diabetes in children suggests that [environmental factors](#) play an important role in the development of the disease. Identifying these factors will offer an opportunity to develop strategies to prevent it and its complications."

Numerous foodstuffs have been linked to islet autoimmunity—the attack on the insulin-producing cells—and T1D, but there is a lack of high quality evidence from prospective studies and the existence of a link remains controversial.

To address this, Professor Virtanen and colleagues explored whether diet in infancy and [early childhood](#) was associated with the development of T1D in thousands of children in Finland.

A group of 5,674 children (3,010 boys and 2,664 girls) with genetic susceptibility to T1D was followed from birth to the age of six. Food records completed by their parents repeatedly from the age of three months to 6 years provided information on their entire diet.

By the age of six, 94 of the children had developed type 1 diabetes. Another 206 developed islet autoimmunity and so were at substantially increased risk of developing T1D in the next few years.

The 34 food groups covered the entire diet, and when they were all factored in, several foods were associated with a higher risk of developing T1D.

"To the best of our knowledge, this is the first time a child's entire diet has been considered at the same time," says Professor Virtanen.

The results show that the more fruit, oats or rye children ate, the more their risk of T1D increased.

In contrast, eating strawberries, blueberries, lingonberries, raspberries, blackcurrants and other [berries](#) appeared to provide protection against T1D. The more berries a child ate, the less likely they were to develop T1D.

"Berries are particularly rich in polyphenols, plant compounds which may dampen the inflammation that is associated with the development of type 1 diabetes," says Professor Virtanen. "On the other hand, fruits may contain [harmful substances](#) that don't occur in berries. For example, berries can be free of pesticides that are found on other fruits."

Oats, bananas, fermented [dairy products](#) (such as yogurts) and wheat were associated with an increased risk of islet autoimmunity, whereas cruciferous vegetables, such as broccoli, cauliflower and cabbage, were associated with decreased risk.

All of the associations were independent—they occurred regardless of the other foods eaten.

"It is important to find out which factors in these foods are responsible for these associations," says Professor Virtanen. "Are the same causative factors or [protective factors](#) found in several foods? If berries are found to contain a particular protective factor, for instance, either that substance or berries themselves could be used to prevent T1D."

It is, however, too early to make any dietary recommendations.

Professor Virtanen says, "Many of the foods that we found to be associated with increased risk of type 1 [diabetes](#) and the disease process are considered part of a healthy diet, and it is important that our results are replicated in other studies before anyone considers making changes to their child's diet."

Provided by Diabetologia

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